IT IS CLAIMED

1. A method for reducing collisions of signals occurring on at least one communication channel in an access network, the access network including at least one Head End and a plurality of network nodes, the signals being transmitted by different nodes over the communication channel, the method comprising:

using filter parameters in selected communication request messages transmitted to a first portion of nodes to thereby limit a number of responses to the communication request messages;

whereby the limited number of responses to the communication request message reduces a likelihood of collisions occurring on the communication channel.

2. The method of claim 1 further comprising:

transmitting a first plurality communication request messages to a first portion of nodes, wherein a first portion of communication request messages do not include filter parameters for restricting responses to the first portion of communication request messages; and

transmitting a second plurality communication request messages to the first portion of nodes, wherein the second portion of the plurality of communication request messages each include dynamically generated filter parameters for restricting a number of responses to the second portion of communication request messages.

3. The method of claim 1 further comprising:

determining a time to transmit a next communication request message to the first portion of nodes; and

determining whether the next communication request message is to include dynamically generated filter parameters for restricting responses to the first communication request.

4. The method of claim 2 further comprising determining whether the next communication request message is to include dynamically generated filter parameters

based upon a number of collisions detected on the communication channel during a predetermined time interval.

5. The method of claim 2 further comprising determining whether the next communication request message is to include dynamically generated filter parameters based upon whether a selected number of previously transmitted communication request messages included filter parameters.

6. The method of claim 2 further comprising:

increasing a transmission ratio of (a) communication request messages which include filter parameters to (b) communication request messages which do not include filter parameters based upon a determination that a number of collisions detected on the communication channel during a predetermined time interval is greater than a first predetermined threshold value; and

decreasing a transmission ratio of (a) communication request messages which include filter parameters to (b) communication request messages which do not include filter parameters based upon a determination that a number of collisions detected on the communication channel during the predetermined time interval is less than a second predetermined threshold value.

7. The method of claim 2 further comprising transmitting communication request messages to the first portion of nodes, wherein every other communication request message includes the filter parameters.

8. The method of claim 2 wherein the filter parameters include an address comparison value parameter which specifies a particular value to be used by each of the first portion of nodes for performing address comparison.

9. The method of claim 1 further comprising dynamically changing the filter parameters each time a new communication request message which includes filter parameters is transmitted to the first portion of nodes.

10.   The method of claim 2 further comprising:

maintaining state information relating to previously transmitted communication request messages which have been transmitted;

said state information including information relating to whether selected previous communication request messages included filter parameters.

11.   The method of claim 1 wherein the access network corresponds to a Digital Video Broadcasting (DVB) network, the communication request message corresponds to a Sign-on Request message transmitted from an interactive network adaptor (INA) to at least one network interface unit (NIU), and wherein the filter parameters correspond to address filter parameters.

12.   The method of claim 11 further comprising using address filter parameters in Sign-On request messages to reduce numbers of NIUs contending for access to the Head End via the communication channel.

13.   The method of claim 11 further comprising using address filter parameters in Sign-On Request messages to prevent selected groups of NIUs from being able to respond to the Sign-On Request messages in order to reduce chances of at least one Sign-On Response message collision on the communication channel.

14.   The method of claim 1 wherein the communication channel is contention-based.

15.   The method of claim 1 wherein the communication channel is configured to utilize a Time Division Multiple Access communication protocol, and wherein at least a portion of timeslots of the communication channel are contention-based.

16.   A method for reducing collisions of signals occurring on at least one communication channel in an access network, the access network including at least one

Head End and a plurality of network nodes, the signals being transmitted by different nodes over the communication channel, the method comprising:

transmitting a first communication request message from the Head End to a first portion of the plurality of nodes, the first communication request message including filter parameters for restricting responses to the first communication request to a first group of the first portion of nodes;

dynamically modifying the filter parameter values; and

transmitting a second communication request message from the Head End to the first portion of nodes, the second communication request message including modified filter parameters for restricting responses to the second communication request to a second group of the first portion of nodes.

17. The method of claim 16 further comprising:

transmitting a first plurality communication request messages to a first portion of nodes, wherein a first portion of communication request messages do not include filter parameters for restricting responses to the first portion of communication request messages; and

transmitting a second plurality communication request messages to the first portion of nodes, wherein the second portion of the plurality of communication request messages each include dynamically generated filter parameters for restricting a number of responses to the second portion of communication request messages.

18. The method of claim 16 further comprising:

determining a time to transmit a next communication request message to the first portion of nodes; and

determining whether the next communication request message is to include dynamically generated filter parameters for restricting responses to the first communication request.

19. The method of claim 17 further comprising determining whether the next communication request message is to include dynamically generated filter

parameters based upon a number of collisions detected on the communication channel during a predetermined time interval.

20. The method of claim 17 further comprising determining whether the next communication request message is to include dynamically generated filter parameters based upon whether a selected number of previously transmitted communication request messages included filter parameters.

21. The method of claim 17 further comprising:

increasing a transmission ratio of (a) communication request messages which include filter parameters to (b) communication request messages which do not include filter parameters based upon a determination that a number of collisions detected on the communication channel during a predetermined time interval is greater than a first predetermined threshold value; and

decreasing a transmission ratio of (a) communication request messages which include filter parameters to (b) communication request messages which do not include filter parameters based upon a determination that a number of collisions detected on the communication channel during the predetermined time interval is less than a second predetermined threshold value.

22. The method of claim 17 further comprising transmitting communication request messages to the first portion of nodes, wherein every other communication request message includes the filter parameters.

23. The method of claim 17 wherein the filter parameters include an address comparison value parameter which specifies a particular value to be used by each of the first portion of nodes for performing address comparison.

24. The method of claim 16 further comprising dynamically changing the filter parameters each time a new communication request message which includes filter parameters is transmitted to the first portion of nodes.

25.   The method of claim 17 further comprising:

maintaining state information relating to previously transmitted communication request messages which have been transmitted;

said state information including information relating to whether selected previous communication request messages included filter parameters.

26.   The method of claim 16 wherein the access network corresponds to a Digital Video Broadcasting (DVB) network, the communication request message corresponds to a Sign-on Request message transmitted from an interactive network adaptor (INA) to at least one network interface unit (NIU), and wherein the filter parameters correspond to address filter parameters.

27.   The method of claim 26 further comprising using address filter parameters in Sign-On request messages to reduce numbers of NIUs contending for access to the Head End via the communication channel.

28.   The method of claim 26 further comprising using address filter parameters in Sign-On Request messages to prevent selected groups of NIUs from being able to respond to the Sign-On Request messages in order to reduce chances of at least one Sign-On Response message collision on the communication channel.

29.   The method of claim 16 wherein the communication channel is contention-based.

30.   The method of claim 16 wherein the communication channel is configured to utilize a Time Division Multiple Access communication protocol, and wherein at least a portion of timeslots of the communication channel are contention-based.

31.   A computer program product for reducing collisions of signals occurring on at least one communication channel in an access network, the access network including at least one Head End and a plurality of network nodes, the signals being

transmitted by different nodes over the communication channel, the computer program product comprising:

a computer usable medium having computer readable code embodied therein, the computer readable code comprising:

computer code for using filter parameters in selected communication request messages transmitted to a first portion of nodes to thereby limit a number of responses to the communication request messages;

whereby the limited number of responses to the communication request message reduces a likelihood of collisions occurring on the communication channel.

32. The computer program product of claim 31 further comprising:

computer code for transmitting a first plurality communication request messages to a first portion of nodes, wherein a first portion of communication request messages do not include filter parameters for restricting responses to the first portion of communication request messages; and

computer code for transmitting a second plurality communication request messages to the first portion of nodes, wherein the second portion of the plurality of communication request messages each include dynamically generated filter parameters for restricting a number of responses to the second portion of communication request messages.

33. The computer program product of claim 31 further comprising:

computer code for determining a time to transmit a next communication request message to the first portion of nodes; and

computer code for determining whether the next communication request message is to include dynamically generated filter parameters for restricting responses to the first communication request.

34. The computer program product of claim 32 further comprising computer code for determining whether the next communication request message is to include dynamically generated filter parameters based upon a number of collisions detected on the communication channel during a predetermined time interval.

35.   The computer program product of claim 32 further comprising computer code for determining whether the next communication request message is to include dynamically generated filter parameters based upon whether a selected number of previously transmitted communication request messages included filter parameters.

36.   The computer program product of claim 32 further comprising:

computer code for increasing a transmission ratio of (a) communication request messages which include filter parameters to (b) communication request messages which do not include filter parameters based upon a determination that a number of collisions detected on the communication channel during a predetermined time interval is greater than a first predetermined threshold value; and

computer code for decreasing a transmission ratio of (a) communication request messages which include filter parameters to (b) communication request messages which do not include filter parameters based upon a determination that a number of collisions detected on the communication channel during the predetermined time interval is less than a second predetermined threshold value.

37.   The computer program product of claim 32 further comprising computer code for transmitting communication request messages to the first portion of nodes, wherein every other communication request message includes the filter parameters.

38.   The computer program product of claim 32 wherein the filter parameters include an address comparison value parameter which specifies a particular value to be used by each of the first portion of nodes for performing address comparison.

39.   The computer program product of claim 31 further comprising computer code for dynamically changing the filter parameters each time a new communication request message which includes filter parameters is transmitted to the first portion of nodes.

40.   The computer program product of claim 32 further comprising:

computer code for maintaining state information relating to previously transmitted communication request messages which have been transmitted;

said state information including information relating to whether selected previous communication request messages included filter parameters.

41.   The computer program product of claim 31 wherein the access network corresponds to a Digital Video Broadcasting (DVB) network, the communication request message corresponds to a Sign-on Request message transmitted from an interactive network adaptor (INA) to at least one network interface unit (NIU), and wherein the filter parameters correspond to address filter parameters.

42.   The computer program product of claim 41 further comprising computer code for using address filter parameters in Sign-On request messages to reduce numbers of NIUs contending for access to the Head End via the communication channel.

43.   The computer program product of claim 41 further comprising computer code for using address filter parameters in Sign-On Request messages to prevent selected groups of NIUs from being able to respond to the Sign-On Request messages in order to reduce chances of at least one Sign-On Response message collision on the communication channel.

44.   The computer program product of claim 31 wherein the communication channel is contention-based.

45.   The computer program product of claim 31 wherein the communication channel is configured to utilize a Time Division Multiple Access communication protocol, and wherein at least a portion of timeslots of the communication channel are contention-based.

46.   A system for reducing collisions of signals occurring on at least one communication channel in an access network, the access network including at least one

Head End and a plurality of network nodes, the signals being transmitted by different nodes over the communication channel, the system comprising:

at least one processor;

memory; and

at least one interface configured to provide at least one communication channel between the Head End and the plurality of network nodes;

the system being configured or designed to use filter parameters in selected communication request messages transmitted to a first portion of nodes to thereby limit a number of responses to the communication request messages;

whereby the limited number of responses to the communication request message reduces a likelihood of collisions occurring on the communication channel.

47.   The system of claim 46 wherein:

the system is further configured or designed to transmit a first plurality communication request messages to a first portion of nodes, wherein a first portion of communication request messages do not include filter parameters for restricting responses to the first portion of communication request messages; and

wherein the system is further configured or designed to transmit a second plurality communication request messages to the first portion of nodes, wherein the second portion of the plurality of communication request messages each include dynamically generated filter parameters for restricting a number of responses to the second portion of communication request messages.

48.   The system of claim 46 wherein:

the system is further configured or designed to determine a time to transmit a next communication request message to the first portion of nodes; and

wherein the system is further configured or designed to determine whether the next communication request message is to include dynamically generated filter parameters for restricting responses to the first communication request.

49.   The system of claim 47 wherein the system is further configured or designed to determine whether the next communication request message is to include

dynamically generated filter parameters based upon a number of collisions detected on the communication channel during a predetermined time interval.

50.   The system of claim 47 wherein the system is further configured or designed to determine whether the next communication request message is to include dynamically generated filter parameters based upon whether a selected number of previously transmitted communication request messages included filter parameters.

51.   The system of claim 47 wherein:

the system is further configured or designed to increase a transmission ratio of (a) communication request messages which include filter parameters to (b) communication request messages which do not include filter parameters based upon a determination that a number of collisions detected on the communication channel during a predetermined time interval is greater than a first predetermined threshold value; and

wherein the system is further configured or designed to decrease a transmission ratio of (a) communication request messages which include filter parameters to (b) communication request messages which do not include filter parameters based upon a determination that a number of collisions detected on the communication channel during the predetermined time interval is less than a second predetermined threshold value.

52.   The system of claim 47 wherein the system is further configured or designed to transmit communication request messages to the first portion of nodes; and

wherein every other communication request message includes the filter parameters.

53.   The system of claim 47 wherein the filter parameters include an address comparison value parameter which specifies a particular value to be used by each of the first portion of nodes for performing address comparison.

54.   The system of claim 46 wherein the system is further configured or designed to dynamically change the filter parameters each time a new communication request message which includes filter parameters is transmitted to the first portion of nodes.

55.   The system of claim 47 wherein:

the processor is configured to store into the memory state information relating to previously transmitted communication request messages which have been transmitted;

said state information including information relating to whether selected previous communication request messages included filter parameters.

56.   The system of claim 46 wherein the access network corresponds to a Digital Video Broadcasting (DVB) network;

the system includes an interactive network adaptor (INA);

wherein the communication request message corresponds to a Sign-on Request message transmitted from an interactive network adaptor (INA) to at least one network interface unit (NIU);

and wherein the filter parameters correspond to address filter parameters.

57.   The system of claim 56 wherein the system is further configured or designed to use address filter parameters in Sign-On request messages to reduce numbers of NIUs contending for access to the Head End via the communication channel.

58.   The system of claim 56 wherein the system is further configured or designed to use address filter parameters in Sign-On Request messages to prevent selected groups of NIUs from being able to respond to the Sign-On Request messages in order to reduce chances of at least one Sign-On Response message collision on the communication channel.

59.   The system of claim 46 wherein the communication channel is contention-based.

60. The system of claim 46 wherein the communication channel is configured to utilize a Time Division Multiple Access communication protocol, and wherein at least a portion of timeslots of the communication channel are contention-based.

61. The system of claim 46,

wherein the system is further configured or designed to transmit a first communication request message from the Head End to a first portion of the plurality of nodes, the first communication request message including filter parameters for restricting responses to the first communication request to a first group of the first portion of nodes;

the system being further configured or designed to dynamically modify the filter parameter values; and

wherein the system is further configured or designed to transmit a second communication request message from the Head End to the first portion of nodes, the second communication request message including the modified filter parameters for restricting responses to the second communication request to a second group of the first portion of nodes.

62. A system for reducing collisions of signals occurring on at least one communication channel in an access network, the access network including at least one Head End and a plurality of network nodes, the signals being transmitted by different nodes over the communication channel, the system comprising:

means for using filter parameters in selected communication request messages transmitted to a first portion of nodes to thereby limit a number of responses to the communication request messages;

whereby the limited number of responses to the communication request message reduces a likelihood of collisions occurring on the communication channel.

63. The system of claim 62 further comprising:

means for transmitting a first plurality communication request messages to a first portion of nodes, wherein a first portion of communication request messages do not include filter parameters for restricting responses to the first portion of communication request messages; and

5   means for transmitting a second plurality communication request messages to the first portion of nodes, wherein the second portion of the plurality of communication request messages each include dynamically generated filter parameters for restricting a number of responses to the second portion of communication request messages.

10   64.   The system of claim 62 further comprising:

means for determining a time to transmit a next communication request message to the first portion of nodes; and

means for determining whether the next communication request message is to include dynamically generated filter parameters for restricting responses to the first

15   communication request.

65.   The system of claim 63 further comprising means for determining whether the next communication request message is to include dynamically generated filter parameters based upon a number of collisions detected on the communication

20   channel during a predetermined time interval.

66.   The system of claim 63 further comprising means for determining whether the next communication request message is to include dynamically generated filter parameters based upon whether a selected number of previously transmitted

25   communication request messages included filter parameters.

67.   The system of claim 63 further comprising:

means for increasing a transmission ratio of (a) communication request messages which include filter parameters to (b) communication request messages which

30   do not include filter parameters based upon a determination that a number of collisions detected on the communication channel during a predetermined time interval is greater than a first predetermined threshold value; and

means for decreasing a transmission ratio of (a) communication request messages which include filter parameters to (b) communication request messages which do not include filter parameters based upon a determination that a number of collisions detected on the communication channel during the predetermined time interval is less than a second predetermined threshold value.

68.   The system of claim 63 further comprising means for transmitting communication request messages to the first portion of nodes, wherein every other communication request message includes the filter parameters.

69.   The system of claim 63 wherein the filter parameters include an address comparison value parameter which specifies a particular value to be used by each of the first portion of nodes for performing address comparison.

70.   The system of claim 62 further comprising means for dynamically changing the filter parameters each time a new communication request message which includes filter parameters is transmitted to the first portion of nodes.

71.   The system of claim 63 further comprising:

means for maintaining state information relating to previously transmitted communication request messages which have been transmitted;

said state information including information relating to whether selected previous communication request messages included filter parameters.

72.   The system of claim 62 wherein the access network corresponds to a Digital Video Broadcasting (DVB) network, the communication request message corresponds to a Sign-on Request message transmitted from an interactive network adaptor (INA) to at least one network interface unit (NIU), and wherein the filter parameters correspond to address filter parameters.

73.   The system of claim 72 further comprising means for using address filter parameters in Sign-On request messages to reduce numbers of NIUs contending for access to the Head End via the communication channel.

74.   The system of claim 72 further comprising means for using address filter parameters in Sign-On Request messages to prevent selected groups of NIUs from being able to respond to the Sign-On Request messages in order to reduce chances of at least one Sign-On Response message collision on the communication channel.

75.   The system of claim 62 wherein the communication channel is contention-based.

76.   The system of claim 62 wherein the communication channel is configured to utilize a Time Division Multiple Access communication protocol, and wherein at least a portion of timeslots of the communication channel are contention-based.